FactSheet

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23681-0001

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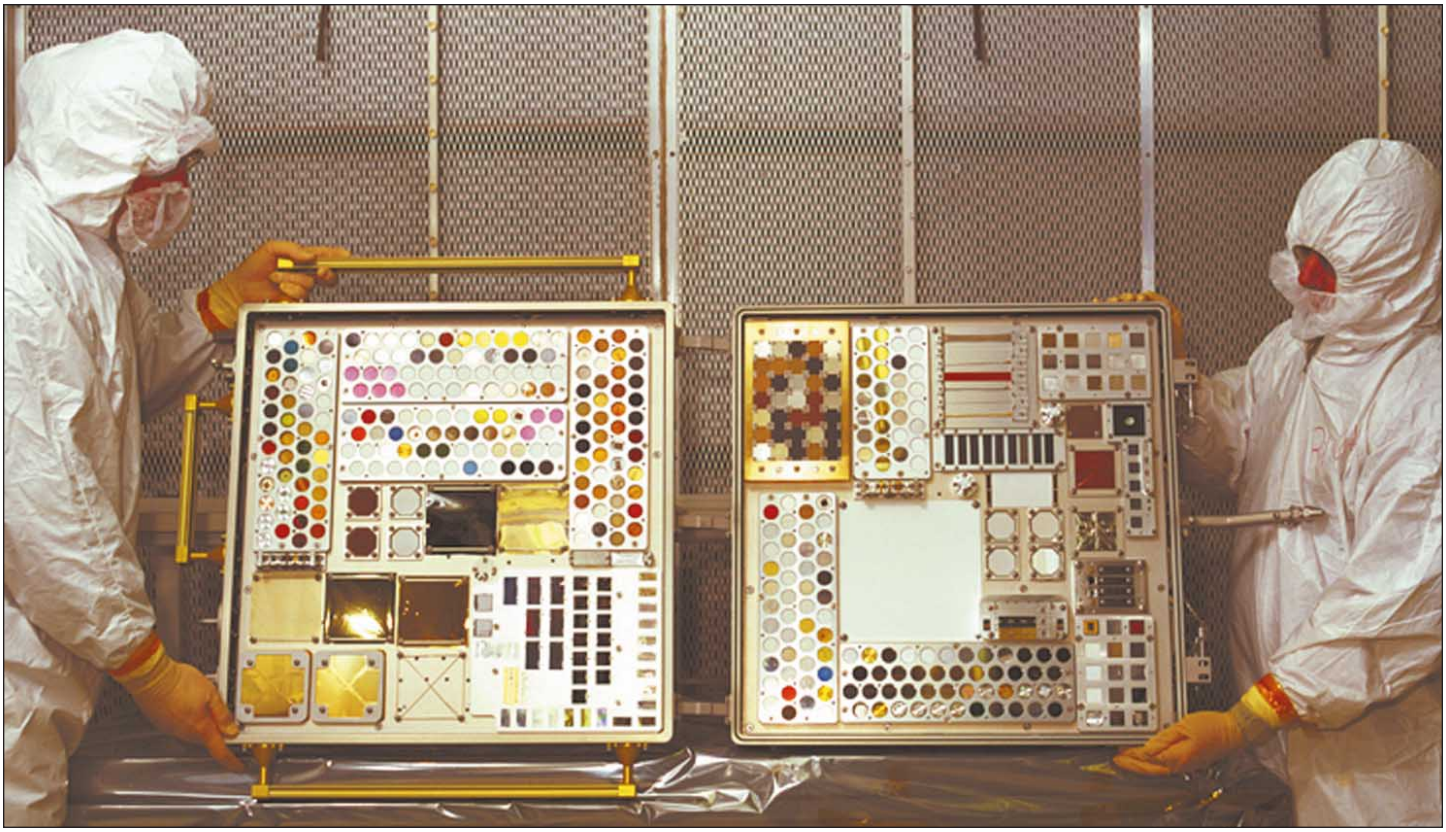
MISSE: Testing materials in space



MISSE project specimens are placed onto trays and inserted into Passive Experiment Containers (PECs).

The Materials International Space Station Experiment (MISSE), the first experiment mounted externally on the International Space Station (ISS), will investigate the effects of long-term exposure of materials to the harsh space environment. MISSE will evaluate the performance, stability, and long-term survivability of materials and components planned for use by NASA, commercial companies and the Department of Defense (DOD) on future Low Earth Orbit (LEO), synchronous orbit, and interplanetary space missions. The Long Duration Exposure Facility (LDEF), which was retrieved in 1990 after spending 69 months in LEO, revealed that space environments are very hostile to many spacecraft materials and components. Atomic oxygen, which is the most prevalent atomic species encountered in LEO, is highly reactive with plastics and some metals causing severe erosion. There is also extreme ultraviolet radiation due to the lack of an atmospheric filter. This radiation deteriorates and darkens many plastics and coatings. The vacuum in space also alters the physical properties of many materials. Impacts of mete-